DOCUMENT RESUME

ED 032 263 SP 003 041

By-Klietsch, Ronald G.; Dodge, Dorothy

Classroom Applications of Instructional Simulation and Learning Games (June 9, 1969-July 3, 1969). Director's Report.

Macalester College, St. Paul, Minn.
Spons Agency-Office of Education (DHEW), Washington, D.C.
Pub Date 69
Grant-OEG-0-9-339131-1482-725
Note-23p.
Available from-Dr. Dorothy Dodge, Macalester College, St. Paul, Minnesota
EDRS Price MF-$0.25 HC-$1.25
Descriptors-*Educational Games, Elementary School Teachers, *Institutes (Training Programs), Secondary School Teachers, *Simulation, Social Sciences

A summer institute was designed to provide 22 certified elementary and secondary social science teachers the opportunity to focus upon concepts and development principles in the methods of learning games and instructional simulation. The 4-week schedule of learning and workshop activities provided a mix of concepts and practice, development and evaluation in these areas: (1) introduction to behavior-based learning systems, systems analysis of simulations and games; (2) positioning simulations and games in a curriculum, the social psychology of simulations and games, modeling learning games; (3) simulation models, analysis, and participation; (4) learning through simulation, educational research on simulation, and developing simulation materials. Major strengths of the program were in its design: (1) the learning environment based on learning objectives, contract programs, competency requirements, and materials; (2) accommodation of diverse interests allowing for individual objectives and implementation; (3) center facilities ideal for materials development, testing, and evaluation, and the well-trained, experienced center staff. Major weaknesses resulted from time limitations. (The 400-page appendix--participant evaluation comments, participant-devised learning games, and institute instruction and orientation materials--is available from Dorothy Dodge, Macalester College, St. Paul, Minn.) (JS)

ED032263

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

DIRECTOR'S REPORT:

CLASSROOM APPLICATIONS OF INSTRUCTIONAL SIMULATION AND LEARNING GAMES

June 9, 1969, through July 3, 1969

Conducted by: Dr. Ronald G. Klietsch

and

Dr. Dorothy Dodge

MACALESTER COLLEGE
Macalester Simulation Center
138 Cambridge Avenue
Saint Paul, Minnesota 55101

SPONSORED BY:

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Educational Personnel Development Branch
Contracts and Grants Division, under

GRANT AUTHORITY: P.L. 89-329, as amended, Title V, Part D
GRANT NUMBER: OEG-0-9-339131-1482-725
PROJECT NUMBER: 339131

SP003041

TABLE OF CONTENTS

Page

I. *INTRODUCTION* 1

II. *PROGRAM OPERATION* 2

1. Planning 2

2. Participants 3

3. Staff. 6

4. Program Orientation. 7

5. Program Operation. 7

6. Evaluation 12

III. *CONCLUSIONS* 17

1. Program Contributions. 17

2. Recommendations. 18

3. Future Plans 19

IV. *APPENDICES*. 20

APPENDIX I Day-by-day comments of participants obtained from evaluation reports.

APPENDIX II Participant-devised learning games.

APPENDIX III Instructional and orientational materials used throughout the Institute.

not available from EDRS — see abstract for availability

I. *INTRODUCTION*

Established in 1968 as an instructional/learning Center to facilitate the Macalester College formal and core-curriculum programs, the Macalester College Simulation Center also bears social service educational responsibilities. These activities involve and include:

A. clearing-house functions as a national establishment in learning games and instructional simulations development and use;

B. research and development in the methodology of gaming and simulation, including formal research activities relating to educational curricula and educational personnel development functions; and,

C. dissemination and promotion of learning games and instructional simulations of established educational value and cost/benefit position, including the conduct of in-house research, extension services, and public/educational formation services.

In accord with these chartered objectives and activities, the Macalester Simulation Center sought and received support from the Office of Health, Education, and Welfare, Bureau of Educational Personnel Development, under Grant Authority, P.L. 89-329, as amended, Title V, Part D, to undertake an instructional/developmental program in the field of learning games and instructional simulations. Entitled Classroom Applications of Instructional Simulations and Learning Games, this project sought the following:

A. To provide an opportunity for 30-35 certified teachers to focus upon concepts and development principles in the methods of learning games and instructional simulation; such opportunity consisting of a mix of concepts and practice, development and evaluation, pertaining to the aforementioned materials.

B. To involve participants in materials through a "hands-on" approach to the development, concept application, materials testing, and evaluation of, learning games and instructional simulations; and, to approach the task of participant involvement through learning task procedures (equivalent to contract exercises) in an achievement-motivation learning enterprise.

C. To direct and implicate those concepts of behavior-based learning systems deemed appropriate to immediate classroom application on a least cost/maximum benefit basis, including achievement-motivation units, youth culture and behavior-based learning systems, performance criteria, and other pertinent learning system's factors.

D. To offer a range of participant learning and workshop activities within the guidelines of the Institute, including:

-- concepts and ideas underlying application, subject-matter and curriculum factors

-- classroom procedures and management under various conditions

-- specific materials, existing and under research/development

-- development and design of materials

-- settings for use within the curriculum and micro-instructional unit

-- formulating simulation and gaming applications, including pre-entry specifications and requirements, materials and evaluation

-- application areas with respect to student readiness, achievement-motivation, and curriculum design

-- evaluating and developing criteria for evaluating existing materials through "hands-on" participation, development, and involvement

-- requirements of classroom use of learning games and instructional simulations, with particular attention to physical factors, sociological factors, and psycho-educational elements

-- system's analysis as an essential aspect of learning games and instructional simulations in light of development tasks, revision/adaptation, and evaluation

-- development and design, including modelling activities, schedule design, and formats of learning games and instructional simulation.

These activities and instructional components were chartered for the Institute recognizing the possible diversity of personnel and likelihood of divergent interests that could best be presumably reconciled through "an individual contract approach to the Institute's objectives."

II. OPERATION OF THE PROGRAM

1. Planning Planning and development for the proposed Institute began in September, 1968, with the development of an intended Institute program. Orginally intended to serve as an educational program for teachers in political science and sociology, the Institute concept was expanded to the more encompassing level, social science, with elementary and secondary school application merged.

In light of Center staff position in the field of educational simulation and gaming, industrial and managerial consulting in games and simulation, plus research activities, only minor consultation was undertaken aside from the benefits of the National Leadership Conference Session, January 19, 1969, and contact with H.E.W. personnel.

A set of reports was issued from the Center to attract Minnesota teacher/administrator attention to the activities of the Center, its educational role and on-going research programs.

Contacts were made with the Minnesota Department of Education, who were able to supply the Center with programmed mailer information. The Center created its own mailing lists and, in turn, through personal contacts, secured the goodwill of the Minnesota Council of Social Studies and other interested State educational groups.

In "real time," the planning requirements of this Institute involved over 130 hours of Dr. Klietsch's assigned Center time, plus over 80 hours of Dr. Dodge's time, thereby commiting over 200 recorded hours of planning and preparation, including proposal formulation, editing, relevance analysis and administrative time.

In light of Center resources, including tele-communications facilities, computer terminal, and intermediate hardware, no additional items were required for Institute activities; only the development of use/schedules was needed. Planning was undertaken with a maximum effort to individualize participant activity and development work. This approach, naturally, placed an overburden on Center staff and personnel. However, the Institute experience would not suggest major re-planning of effort. Rather, further individual achievement-motivation units are needed to fully individualize the Institute aims.

As a further planning aspect, it would have been desirable to provide more exposure to various simulation and learning games materials in actual classroom settings. However, on a time/cost basis, it would not have been feasible to use more simulations, but it would be well to have more materials available for participant inspection. (The Center has over 65 simulations and micro-units, but examining the materials, versus using the materials, affords quite different benefits.

2. Participants The name, address, educational employment and specialty area of each Institute participant are detailed in TABLE I. The procedures observed in selecting participants conformed to the requirements of HEW, Bureau of Educational Personnel Development; no discrimination was intentionally or unintentionally noted. Basically, participants were selected because of their Institute interest, past classroom use of the materials, and summer availability. While all schools in the State of Minnesota and over 300 school systems in Wisconsin were

TABLE I

Institute Participants

NAME & ADDRESS	EDUCATIONAL EMPLOYMENT	SPECIALTY AREA
1. V. Fred Anderson, Jr. 2513 13th Avenue East No. St. Paul, Minn. 55109	#622 North Saint Paul, Minnesota	American History, Psychology
2. Robert M. Bergstrom 8239 Medicine Lake Road Golden Valley, Minn. 55427	#273 Roseville, Minnesota	Social Studies, Economics
3. Carl E. Carlson 4213 Crocker Edina, Minnesota 55416	Special #1 Minneapolis, Minnesota	Economics, Political Science, Internat'l Relations
4. Russell R. Christensen 6104 Ridgeway Road Edina, Minnesota 55436	#283 St. Louis Park, Minnesota	Geography, Far Eastern Affairs
5. Dayle L. De Clercq Center City Minnesota 55012	#141 Chisago Lakes, Minnesota	History
6. Howard E. Hallgren 16224 Birch Lane Minnetonka, Minn. 55343	#283 St. Louis Park, Minnesota	American History
7. Laurel E. Hallman 680 East Hawthorne St. Paul, Minn. 55106	#622 North Saint Paul, Minnesota	Middle Grades (Elementary)
8. Frederick H. Hawker 8015 Washington St.,N.E. Spring Lake Pk., Minn. 55432	#16 Spring Lake Park, Minnesota	Social Studies
9. Earl B. Hovland 10316 Lyndale Ave., So. Bloomington, Minn. 55420	Breck (Private) Minneapolis, Minnesota	Mathematics (Lower School Supervisor)
10. Ralph K. James 10924 Russell Ave., So. Bloomington, Minn. 55431	#271 Bloomington, Minnesota	Mathematics
11. Jeanne M. Jones 1600 Ford Parkway St. Paul, Minnesota 55116	#271 Bloomington, Minnesota	English
12. Albert Kaufman 3117 Virginia South St. Louis Pk., Minn. 55426	#271 Bloomington, Minnesota	Social Studies

TABLE I, (continued)

Institute Participants

NAME & ADDRESS	EDUCATIONAL EMPLOYMENT	SPECIALTY AREA
13. Gary L. Kunz 426 12th Ave., So. So. St. Paul, Minn. 55075	Special #6 South Saint Paul, Minnesota	United States History
14. Kent T. Layden 5800 42nd Ave. No. Apt. #311 Minneapolis, Minn. 55422	#11 Anoka-Hennepin, Minnesota	Social Studies, Political Science
15. Russell J. Loraas 10916 Drew Ave., So. Bloomington, Minn. 55431	#271 Bloomington, Minnesota	Social Studies
16. Marie E. Murphy 1407 Emerson Ave., No. Minneapolis, Minn. 55411	Annunciation (Private) Minneapolis, Minnesota	American History, Sociology, Anthropology
17. Lanny C. Orning 6511 2nd St., N.E. Fridley, Minnesota 55432	#14 Fridley, Minnesota	Political Science, Social Studies, American History
18. Marian P. Radke 177 Hawes Avenue St. Paul, Minnesota 55112	#281 Robbinsdale, Minnesota	Middle Grades (Elementary)
19. Martha S. Reckdahl 7823 Alden Way, N.E. Fridley, Minnesota 55432	#622 North Saint Paul, Minnesota	Social Studies Sociology
20. Steve R. Silianoff 408 18th Ave., No. So. St. Paul, Minn. 55075	Special #6 South Saint Paul, Minnesota	Economics, Political Science, Social Studies
21. Daniel F. Willette 5317 Chicago Ave., So. Minneapolis, Minn. 55417	Special #1 Minneapolis, Minnesota	Social Studies
22. Floyd S. Wolters, Jr. 8620 Zenith Road Bloomington, Minn. 55431	#271 Bloomington, Minnesota	Social Studies

notified of the proposed Institute, virtually all Institute participants resided within the Twin City Metropolitan area and/or adjacent metro-county area. On the basis of earlier research in classroom use of learning games and simulations, it was expected that the majority of applicants would come from this area.

The background of participants was unusual in these respects: all were older teachers, with an average of 8 years in-service, all had previously used at least one simulation or more in actual classroom situations, and, with only three exceptions, participants were directly related to curriculum work in their school system. A mix of elementary and secondary teachers was sought, as well as, a subject-matter specialty mix. However, in retrospect, it appears wiser to operate with only secondary teachers or only elementary teachers. While the individualization program of the Institute overcame certain certification level problems, it would be advisable to use only one sector (secondary or elementary participants) to foster application depth.

With respect to the subject-matter mix, it is recommended that the broadly-based mix fostered diversity of applications, especially in the learning games development phase. (See materials enclosed) Ideally, more physical science and mathematics teachers should have been sought: most participants came from social science and English specialties.

3. Staff The Center Staff includes a director, Dr. Ronald G. Klietsch; a research assistant group; Political Science liaison, Dr. Dorothy Dodge; plus other resource persons from various departments of Macalester College.

While it was deemed advisable to include outside guest speakers, the lateness of grant award allowed only confirmation of two persons: Dr. Thorwald Esbensen, Professor of Education, Florida State University, Tallahassee, Florida, addressed the Institute on achievement-motivation systems, using a lecture method and slide presentation. Both the evaluation and materials distributed were favorably viewed by participants. Mr. James Hanson, Research Director, Instructional Simulations, Inc., Newport, Minnesota, served as a resource person and lecturer in learning games development.

Ideally, two additional half-day presentations would have allowed more time and attention on behavioral objectives and competency requirements in gaming and simulation. Other proposed speakers were unable to attend the Institute because of prior commitments.

Staff met regularly before and throughout the Institute to assess developments, needs, and suggested program changes. Daily schedules were devised, along with timetables, for staffing and program activities.

It was noted early that the staff requirements for implementing a contract-based Institute were excessive. Very simply, the

demands of participants to complement their individual contracts, plus special interests, far exceeded the resource time of the staff. While team-teaching methods were used for instructional phases, the workshop periods required more than 2 1/2 hours a week per person per instructor ... which suggests that additional resource persons were needed during workshop activities to assist participants in games and simulation development work. The instructional portion of the Institute faired well, but the workshop portions did not fully permit the extent of individualized assistance deemed vital.

4. Program Orientation No formal orientation program preceded the actual commencement of the Institute. However, participants were supplied background information on the Center, the National Gaming Council meetings, plus other relevant data prior to their start-up. Throughout the Institute, various instructional periods were designated as "orientational" or "instructional" as opposed to "direct application." Orientation periods focused on topics of a broader scope than direct applications units, e.g., "youth culture and the elements of social similarity to games and simulations," "the management of the classroom and simulation introduction," and "the formulation and theory of achievement-motivation." All "orientation sessions" were designed as "bridges" between methods or techniques, including the rationale for methods, and the applications period. (It was suggested by the participants that certain of the orientation periods should have been moved forward to provide broader perspective to applications, rather than later in the Institute.)

5. Program Operation A detailed agenda of instructional and workshop activities was prepared for the Institute. While these guidelines were observed, certain variations were introduced to emphasize development work. The outlines of the Institute by week are detailed in TABLE II, by day in TABLE III, and by a single day in TABLE IV.

TABLE II

Institute Schedule: by week

1st Week
- Introduction to behavior-based learning systems
- System's analysis of simulations and games

2nd Week
- Positioning simulations and games in a curriculum
- The social psychology of simulations and games
- Modelling learning games

3rd Week
- Simulation models
- Simulation analysis
- Simulation participation

4th Week
- Learning through simulation
- Educational research on simulation
- Developing simulation materials

TABLE III

Institute Schedule: by day

TOPICS		ACTIVITIES AND TASKS
1st Week		
Day 1:	Introduction to Institute	Survey of Institute materials
Day 2:	Introduction to behavior-based learning systems (Unit A)	Elements of learning games: classification-matching systems
Day 3:	Introduction to behavior-based learning systems (Unit B)	Elements of learning games: communications systems & communication-based games
Day 4:	Formulating learning objectives	Preparation of a learning game Exercise 1: systems analysis of tasks
Day 5:	Evaluation & serialization of learning tasks through games	Preparation of a learning game Exercise 2: creating the subject-matter & information system
2nd Week		
Day 1:	Establishing performance-achievement criteria: measures & meaning	Preparation of learning game Exercise 3: creating rules & behavioral guidelines
Day 2:	Positioning the learning game in the curriculum (Unit A)	Preparation of learning game Exercise 4: test & evaluation
Day 3:	Positioning the learning game in the curriculum (Unit B)	Research applications of learning games
Day 4:	Student ambience, motivation & learning differences (Unit A)	Introduction to instructional simulations: exchange-bargaining episodes
Day 5:	Student ambience, motivation & learning differences (Unit B)	Analysis of behavior & discussion of exchange-bargaining model

TABLE III, (continued)

Institute Schedule: by day

TOPICS		ACTIVITIES AND TASKS
3rd Week		
Day 1:	Introduction to simulations & simulation models (Unit A)	Modelling of a simulation: basic systems analysis
Day 2:	Introduction to simulations & simulation models (Unit B)	Embodying structures, processes & constraints: Zeno exercises (1)
Day 3:	Learning objectives & simulations: socio-drama, role-playing & performance-achievements	Embodying structures, processes & constraints: Zeno exercises (2)
Day 4:	Classroom applications & problems related to simulation useage	Embodying structures, processes & constraints: Zeno exercises (3)
Day 5:	Human factors analysis & classroom simulation activities	Survey of selected commercially-available simulations
4th Week		
Day 1:	Learning value of instructional simulation	Participation in Impact, a community simulation
Day 2:	Cost/benefit analysis of classroom learning games & instructional simulations	Participation in Impact, a community simulation
Day 3:	Research on instructional simulation: current status & needs	Analysis of Impact data and human factors reports
Day 4:	How to introduce learning games & instructional simulations in your school	Evaluation of Institute
Day 5:	Termination of Institute	

TABLE IV

Institute Schedule: a single day *

8:00 a.m.	Review of previous activities & tasks discussion: gen'l agenda & commentaries
8:15 a.m.	Introduction to topic for the day: Institute faculty or outside speaker: instructional or orientation unit
9:30 a.m.	Coffee break & general activities organization
10:00 a.m.	Resume topic of the day: Institute faculty or outside speaker
10:45 a.m.	Questions & comments: applications relating to topics
11:00 a.m.	Small-groups discussion: activities & tasks preparation
11:30 a.m.	Evaluation of morning's activities
11:45 a.m.	NOON BREAK
1:15 p.m.	Resume Institute: review activities & tasks prior to group or individual pursuit
2:45 p.m.	Assembly for discussion and problem-analysis-workshop
3:15 p.m.	Coffee break & general activities organization
3:30 p.m.	Individual conferences & applications problems: independent study
4:45 p.m.	(Preparation for evening activities, when scheduled)

* Subject to simulation run-time requirements, variations in individual contract and workshop activities (afternoon).

Notable variations and departures from the pre-established Institute guidelines included the following:

1. Contracts for participants were limited to learning game development for each individual, while group simulation development was encouraged rather than individual development. Time availability was a major factor here.

2. ZENO exercises were replaced by TRACTS, an urban renewal simulation; and COMPASS, a community action simulation. These changes were prompted by participant interests in social science, rather than economics per se. Further, a jointly sponsored simulation exercise with St. Catherine's College, History Institute, permitted the conduct of a 40-person simulation.

3. The IBM simulation, MANAGE, a computer-based simulation of a firm, was used in lieu of ZENO political exercises.

4. A participant-developed set of simulations was conducted for evaluation and operability critique. This addition replaced the IMPACT community simulation period.

With respect to the achievement of Institute objectives, the following was noted:

a) Each participant devised a classroom learning game, including development of appropriate subject matter, tested the unit with fellow participants, and undertook necessary revision;

b) Each participant engaged in a minimum of 10 simulations and learning game units with options for an additional 5 units; these included:

In-basket (generic)	INS., Inter-National Simulation, SRA
CONTROL-THINGS - 3M Co.	TRACTS, ISI
CONCEDE-THINGS - 3M Co.	COMPASS, ISI
SYSTEM I Learning Game, ISI	DANGEROUS PARALLEL, Scott-Foresman
CRISES, WBSI	DEMOCRACY, 4H

Optional units:

IBM - MANAGE	DELPHI (generic)
CONFLICTO	F.L.I.P., ISI
VENTURE, Proctor & Gamble	

c) Each participant was provided with materials and instructional aids to assist development and understanding of techniques. Major instructional aids were:

SIMULATION & SOCIETY: An Exploration of Scientific Gaming, John Raser, Allyn & Bacon, 1969

INTRODUCTION TO LEARNING GAMES & INSTRUCTIONAL SIMULATION, A Curriculum Guideline, R. G. Klietsch, ISI, 1969

Other reports, monographs, articles and unpublished memoranda were also supplied participants in conjunction with instructional units.

d) Basic concepts and methods were presented in daily instructional units. If participants evaluations and remarks are a measure of comprehension and transfer to development activity, then, participants activity/response indicated mastery of the basic concepts and practice of the method.

Staff reaction to the effectiveness of the instructional/workshop mix suggested that more time was needed for workshop activities. Further, had programmed materials been available for concept learning and terminology, they would have greatly facilitated the instructional units. In this respect, tape-recorded or VTR units would provide the "patient form of instruction," freeing more time for workshop units.

6. Evaluation .... WHAT DID THE PARTICIPANTS FEEL ABOUT THE OVERALL INSTRUCTIONAL/PARTICIPATION ASPECTS?

Daily summaries were prepared from individual evaluation reports. These reports (see specimen) were designed to secure participant reactions to the emphasis, focus, scope and relevance of selected factors deemed of classroom importance to instructional simulations and learning games.

By overall order of importance, participants felt that the following instructional components were supplied by the instructors: (by frequency of unsolicited response .. 22 persons, 17 days, 12 categories)

Response frequency	by day	by persons	ITEM and (meaning of item)
198	11.6	9.0	CONCEPTS & IDEAS = central notions pertaining to the elements of classroom gaming and simulation
152	8.9	6.9	MATERIALS = review of those materials which are available for classroom use, or needs, including specific components, use, or design
145	8.5	6.5	SYSTEM'S ANALYSIS = concerns of the learning or subject-matter models/systems used in learning games or simulations, including system fabrication and conceptual analysis
144	8.4	6.5	PROCEDURES = basic operating requirements, including start-up, start-in, and start-down factors in learning games and simulations
143	8.4	6.5	DEVELOPMENT & DESIGN = steps followed in the creation, fabrication, design, and testing of a learning game or simulation, including behavioral/learning objectives and competency requirements

(continued)

Response frequency	by day	by persons	ITEM and (meaning of item)
125	7.3	5.6	ORGANIZATION = refer to classroom (physical) and human factors required for effective educational use of learning games and simulation, plus the social organization of the materials under consideration
121	7.1	5.6	APPLICATIONS = specific curriculum positioning of material plus value/benefits, trade-offs with other materials, requirements and entry levels specifications
94	5.5	4.2	FORMULATION = refers to background factors prompting the use of a learning game or simulation in curriculum, including "on-the-spot" development of materials, e.g., Delphi techniques, Oracle techniques, Q techniques or Order techniques
93	5.4.	4.2	SETTINGS = refers to the "subject-matter" setting or instructional component related to the use of the learning game or simulation *(Deemed a negative factor in Institute proceedings in light of diversity of background and interests.)
83	4.8	3.7	EVALUATION = refers to instructor evaluation of materials for classroom use, other pertinent research, and critical comment
78	4.5	3.8	MANAGEMENT = refers to instructional/learning factors deemed relevant to the introduction of materials in the classroom, plus conduct of gaming and/or simulation
55	3.1	2.3	REVISION = adaptation and modification of materials to meet classroom use/learning objectives

CONCLUSION: On the basis of a day-to-day evaluation of instruction and "hands-on" development period, participants indicated that:

1) On a personal "use-interest-benefit" level, the statistical citation of a category or item would approximate 3.96 or 4 categories; that is, each person should have benefitted by instruction and development to the extent of citing 4 categories as of use-interest-benefit, considering the 22 participants and the 17 days. IN THIS RESPECT, the INSTITUTE EXCEEDED THE TOPICAL COVERAGE (as indicated by participant citation of topics by an average of 4.8). This means that targets were observed, or exceeded, in terms of "topical coverage."

2) Did individuals benefit or did the same individuals benefit? Using the statistical program which would allow analysis of individual versus group benefit, it appears that the group as a whole benefited more by the Institute than did individual participants. The statistical interpretation suggests that, despite individual citation of benefit, the estimator value of individual benefit was not exceeded (11.3 days of benefits) while the group benefit estimator of 9.6 days was exceeded. This means that Institute participants felt that they benefited most as individual "classroom teachers" only 10 days of the Institute, while as a group, benefits were gained on the average of 14.5 days. This suggests a needed criterion in the participant selection policy, as well as, the dispersal of benefits; it suggests that teachers from common disciplines would benefit most, say social science, while a mix of backgrounds apparently inhibits individual benefits. (This was orally communicated to the Directors under several circumstances, and with repeated frequency as individual needs became apparent.)

3) Was the length of time appropriate to the intended Institute program objectives? From the evaluation data, the lack of time for required assimilation/transfer became increasingly evident. Time was not available for in-depth learning. Consequently, citation of learned items diminished, the "frustration factors" compounded, and the force of required learning increased. This suggests that participants were exposed to too much in the time available, too many requirements, but not to the detriment of the essential contract learning program underlying the project. It suggests that transfer learning with participants requires more time in execution or more careful selection of materials concepts for teacher benefit. (Naturally, follow-up in classroom use will confirm/or not this notion.) However, as an intended heavy dose of concepts and materials, the benefits can be measured in strict applications terms over the next 12 months.

4) On the basis of "communicating informationally-valuable instruction" to "not useful information," the following results were obtained, and conclusions derived:

   a) The speaker program (despite the lateness of grant award) afforded persons knowledgeable in their fields and of pertinence to the Institute participants

   b) The least informationally-valuable items, as perceived by teachers, were: units dealing with specific subject-matter and student roles in terms of learning games or simulations; theoretical subject-matter factors and simulation; and, efforts on the part of the participants to devise their own simulations and simulation models

   c) Participants sought ideas and applications all too frequently on the basis of "hunches and pre-conceived application ideas." A substantial portion of the Institute dealt with simulation and gaming applications from a non-subject-matter basis. This not only caused frustration for the subject-matter-oriented

teacher, but some disorientation. We felt the Institute was methods-directed; it was concerned more about how to give instruction through gaming and simulation, than what to teach.

(Reprints of Participant's Daily Evaluations and Summaries are available upon request, together with statistical analysis program.)

INSTITUTE CRITIQUE AND EVALUATION: Throughout the Institute, as well as, during the terminal session, efforts were made to secure reactions of participants to instructional inadequacy and relevance. Participant comments focused upon:

A. Language and terminology problems. Simulation and gaming have acquired a distinct language, as much due to their origins in operations research and system's development, as through educational transfer. Consequently, there are over 300 terms which were unfamiliar and uncontexted for the participants. (A glossary of terms is being prepared based on frequency of systems usage and central simulation application.)

B. "Shot-gun" approach. Several participants felt that the Institute sought to cover too much ground in the time available...four weeks was not enough time to foster participant understanding and learning transfer. Consequently, participants sought more and more those simulations and games which offered direct (and often diagnostic) assistance in classroom use, avoiding interest in complex simulations.

C. Most teachers stated a desire for more work with simulation and gaming modelling....the translation of real world materials into simulation and game design. The request for modelling activity/development was based almost entirely upon work with specific simulations and the desire to adapt these to classroom applications. (This venture was not pursued due to ethical, professional and research reasons, and due to time constraints...all of which were pointed out to participants.)

D. Participants sought more materials and access to materials than available to the Center. While the Center has over 65 learning games and simulations, (and assigned at no cost 66 games from the 3M Co., St. Paul, to all participants) still participants sought materials unavailable at present from obscure catalogues and product brochures. (For example, ABT ASSOCIATES were early contacted, as well as, in the course of the Institute, for selected materials. In the absence of a response, materials were not available or supplied that had direct educational bearing.) However, the Center is seeking to expand its materials base, without jeopardizing its educational role.

E. Participants (20/22) wanted follow-up sessions dedicated to simulation and gaming principles. In particular, participants sought in-service assistance in using these materials and concepts. (A fall workshop and institute program will be available to 35 participants.) Further, participants sought access to national, regional or even local activity centers to keep abreast of the methods,

applications, and problems.

F. Teacher/participants were concerned about national developments in this broad field of gaming and simulation and means for being informed. At present no journal, newsletter, report system or other periodic communication informs teachers of advances or applications in the field. (A national group will shortly be instituted with the expressed aims of teacher accreditation and material certification, thereby ameliorating the present situation.)

G. Participants noted that access to the reading materials in advance of the Institute would have assisted them. (Considering the situation, this is recognized as a critique, but it is questionable whether benefits would have been gained by uncharted readings programs.)

H. Participants responded most favorable to the concepts derived from Bloom, Meagher, Glaser, Esbensen and others. However, very few, perhaps 5 teachers, were fully aware of the use/implications of such person's educational works. Consequently, nearly all agreed that more sessions should be devoted to achievement-motivation to insure participant understanding/comprehension of these ideas. (A critique well noted and substantially covered by the addition of Banathey's work in the field.)

I. Participants requested summaries of existing materials to assist them in classroom selection. (A catalogue is being prepared, similar to the SURISS Classification Network System, but will not be available until September 15, 1969.)

J. Participants sought cross-disciplinary approaches to gaming and simulation, suggesting that the method can affect this transfer. While evidence supports their position, the Center was unable to provide cross-disciplinary work except in the social sciences.

K. Participants especially cited the need for "applications time," including work with actual classrooms in testing/evaluating materials developed during the Institute. (Only 2 elementary schools were immediately available, with 1 junior high for a 2-week period.) However, participants felt they would have benefited from direct interaction during the development phase to have students serve as test-evaluators.

L. As a method, behavior-based learning requires more entry time, both conceptually and in performance/application time. A minimum of 6 weeks was suggested by participants for any future Institute.

M. The absence of other media of major import was also signaled. It was suggested that taped units or film strips would heighten classroom realism and ease of material introduction.

III. CONCLUSIONS

1. Program Contributions Significant outcomes and Institute contributions.

The major benefits of the Institute were these:

A. Participants were "immersed" in concepts and practices of behavior-based learning systems. While most participants had certain pre-conceptions about games and simulations, there was general consensus that the techniques and procedures are valuable classroom tools....more so now that participants felt more confident in their use and introduction. A higher degree of critical thought was engendered. The likelihood that these teachers will actually use their new techniques and materials is very high. (One teacher wrote the Director a letter on the termination of the Institute, partially quoted below --

> "it (the Institute) has given me an insight into a new technique for presenting subject materials and classroom organization. I feel positive that this will be a valuable asset in my association with the 'young people' of South St. Paul High School.")

B. Teachers were provided a direct involvement experience, both in terms of games and simulation interaction, development and materials evaluation. This experience is otherwise unavailable in the Midwest, except on a "do-it-yourself" basis, or "trial and error" classroom experience. More important, participants were allowed the "freedom to err" in learning about the materials in a "controlled" context similar to that recommended for classroom application.

C. Attitudes were not only re-directed toward the cost/benefits of these materials, but, equally valuable, participants saw that there was no "mystery or secret craft" involved in actual unit development or application. While some teachers were reluctant to begin the actual learning game fabrication procedures because of the apparent complexity, as work proceded, the role of systematic instructional unit preparation became increasingly evident. In sum, participants learned both the fundamentals of gaming and simulation systems, as well as, the potential application range.

The major strengths of the Institute program lie in the actual design used. That is, participants themselves worked in an educational environment based on learning objectives, contract programs, competency requirements, plus materials, creating the outlines of the system very similar to that recommended for actual classroom use. Secondly, a diversity of interests was accommodated in the design, thereby allowing for individual objectives and implementation. Thirdly, the Center facilities are virtually "ideal" for material development, testing, and evaluation. Center staff are well-trained and experienced in the field of gaming and simulation, both from an educational perspective, as well as, in various subject-matter disciplines.

The major weakness of the program was the time limitation: it became obvious by the end of the first week that participants required more depth and instruction in basic system's concepts and programs. These were supplied in group instruction. There were no insurmountable problems encountered by Staff or participants, with the exception of time constraints. Participants responded favorably to the various workshop activities, requesting that follow-up sessions be conducted in the Fall. If a single participant factor was noted, it would be the value of approaching education from a human factors perspective, including the functional design of micro-instructional units involving student behaviors. Were summer school classes available conveniently nearby, participants would have eagerly sought actual classroom testing of materials during the Institute. This opportunity was explored, but outside staff support could not be located.

2. Recommendations On the basis of Institute evaluations, the growth in application of classroom learning games and instructional simulations, the following recommendations are made:

Pertaining to BEPD:

a. Continued underwriting and sponsorship of training programs in gaming and simulation would do more than serve as "methods institutes" or programs. The rapid growth in this field, coupled to increasing teacher interest, requires continued support. On the basis of Center research, games and simulations are currently used by over 35% of the schools within a 100-mile radius of the Twin Cities. However, few teachers (less than 5%) have had any formal guidance or training in classroom use of these materials. And, the materials available do not readily suggest "apt or relevant" curriculum applications.

b. BEPD should be recommended for sponsoring this Institute. However, additional in-service programs, workshops, projects should be encouraged. The technology, the craft and art, plus the diversity of materials suggest a need to continually up-date teacher information and skills in this field. Particularly, a newsletter, journal, or even an ERIC unit should be cooperatively encouraged.

c. Follow-up units are required to obtain classroom use/effectiveness data from teachers, including classroom problems, curriculum positioning difficulties, and adaptation requirements for various curriculum applications and student populations.

Pertaining to Macalester College Simulation Center:

a. Agreeable to BEPD and Macalester College, the Simulation Center would re-submit an Institute proposal, including revisions, for the operation of an Institute, Summer -- 1970.

b. The recommendations noted in conjunction with the Evaluation Section would be implemented on a time/cost basis, with

particular attention to Institute design and achievement-motivation unit development, information services, and in-house service programs for local teachers.

3. Future Plans As noted below, the Macalester College Simulation Center shall actively seek to continue year-round training and instructional programs in gaming and simulation.

(Pending)

CENTER WORKSHOPS AND TRAINING PROGRAMS. This Fall the Simulation Center will conduct a variety of workshops and training programs in learning games development, simulations, and behavior-based learning systems, including achievement-motivation systems designed for the classroom. Early registration will assure your acceptance, since enrollment will be limited to 35 registrants.

** October 8, 1969 7:00 p.m. - 10:00 p.m.	Contract Learning Systems (Achievement-Motivation Unit 1)
-- October 11, 1969 9:00 a.m. - 4:00 p.m.	Learning Games: SYSTEM 1
** October 15, 1969 7:00 p.m. - 10:00 p.m.	Behavioral Objectives & Competency Requirements (Achievement-Motivation Unit 2)
** October 22, 1969 7:00 p.m. - 10:00 p.m.	Social Science Simulation: Dimensions of Simulation Models & Instructional Use
-- October 25, 1969 9:00 a.m. - 4:00 p.m.	Community Simulations: Curriculum Development & Simulation Modules
** October 29, 1969 7:00 p.m. - 10:00 p.m.	Learning Games: SYSTEM 2
** November 5, 1969 7:00 p.m. - 10:00 p.m.	Economic Simulations: Dimensions of Simulation Models & Instructional Use
-- November 8, 1969 9:00 a.m. - 4:00 p.m.	Economic Simulations: Curriculum Development & Simulation Modules -- Micro and Macro Units
** November 12, 1969 7:00 p.m. - 10:00 p.m.	Learning Games: SYSTEM 3
** November 19, 1969 7:00 p.m. - 10:00 p.m.	Political Science Simulations: Dimensions of Simulation Models & Instructional Use
-- November 22, 1969 9:00 a.m. - 4:00 p.m.	Political Science Simulations: Curriculum Development & Simulation Modules -- International Relations & Political Behavior
** December 3, 1969 7:00 p.m. - 10:00 p.m.	Learning Games: SYSTEM 4

Lastly, it is the intention of Center staff to actively pursue continuation of summer institute programs, research projects, and material evaluation.

IV. APPENDICES

The following appendices contain:

APPENDIX I	Day-by-day comments of participants obtained from evaluation reports.
APPENDIX II	Participant-devised learning games.
APPENDIX III	Instructional and orientational materials used throughout the Institute.

CLASSROOM APPLICATIONS OF INSTRUCTIONAL SIMULATIONS AND LEARNING GAMES

SUMMARY OF EXPENDITURES

1.0 Direct Costs					
1.1 Administrative	(Klietsch)	$3,299.50)	$6,599.00	($ 1,931.00	
1.2 Instructional	(Dodge)	3,299.50)		(4,668.00	
1.3 Consultant	(Esbensen)		125.00		
	(Hanson)		125.00		250.00
1.4 Sec., clerk	(Landry)		262.50		
	(Powell)		262.50		525.00
			TOTAL		$ 7,374.00
4.0 Instructional Supplies					
4.2 Expendable Supplies					
System 1 Learning Game			$ 216.70		
Text: Sim. & Society			60.02		
Text: Intro. Learning Games & Inst. Simulation			240.00		
Prototype Supplies			50.00		
Simulation: TRACTS			28.50		$ 595.22
			TOTAL		$ 595.22
5.0 Other Direct Costs					
5.1 Employee Benefits					$ 770.00
5.2 Communications & Publicity					
Announcement Mailers & Postage			$ 183.95		
Phone Calls			12.49		
Photographs			59.00		255.44
5.3 Reproduction & Office Supplies					
Repro. Services, June			$ 275.50		
Repro. Services, July			141.64		
Office Supplies			11.84		428.98
5.4 Equipment Rental					
Audio Visual			32.13		
IBM Terminal use			100.00		
IBM Terminal rental			82.80		
IBM Data Phone			43.93		258.86
			TOTAL		$ 1,713.28
TOTAL DIRECT COSTS					$ 9,682.50
6.0 Stipends and Dependent Allowances					
6.4 Short term, full-time, experienced personnel					
22 Participants		22 x $75 x 4 weeks			$ 6,600.00
47 Dependents		47 x $15 x 4 weeks			2,820.00
(earlier estimated		22 x $15 x 4 weeks, $1,320.00)			
TOTAL STIPEND COSTS					$ 9,420.00
TOTAL FEDERAL FUNDS SUBJECT TO INDIRECT COST					$19,102.50
7.0 Indirect Costs (8%)					$ 1,528.20
9.0 TOTAL COSTS (Direct plus Stipends plus Indirect)					$20,630.70
10.0 TOTAL EPDG FUNDS REQUESTED					$20,630.70